Seeing Things Differently: Rethinking the Relationship Between Data and Models

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This presentation explores how the practice of hydrology depends on computer models while at the same time new methods have been adapted or developed for characterizing and monitoring the hydrosphere.

These two areas have evolved almost completely independently of one another, but a unified approach is needed — designing measurement methods in the context of numerical analyses that address specific scientific and management questions. Accordingly, this talk is an integrated overview of the relationships among models, measurements, and decisions, including:

•Discussing what is actually being measured when measurements are made, with a focus on the large scale from pumping tests to geophysics
•Describing how these measurements currently are being merged with models and how this process could be improved
•Covering how hydrologists can turn the standard approach to combining measurements and models around by using models to help identify more informative measurements
•Exploring how the optimal design of a measurement and modeling campaign can, and should be, driven by the specific practical or scientific questions being asked.

This lecture is part of the Henry Darcy Distinguished Lecture Series in Groundwater Science.